$$\frac{d}{dx}\left[a^x\right] = (Ln\,a)\,a^x \qquad \frac{d}{dx}\left[TAN\ X\right] = SEC^2 X$$

$$\frac{d}{dx}\left[a^u\right] = (Ln\,a)\,a^u \cdot u' \qquad \frac{d}{dx}\left[TAN\ u\right] = SEC^2 u \cdot u'$$

12. $f(x) = \underbrace{3^{x^2-3X}}_{P}\ \underbrace{TAN\,(3X)}_{Q}$

$$P' = (Ln\,3)\,3^{x^2-3X} \cdot \frac{d}{dx}(x^2-3X) \qquad Q' = SEC^2(3X) \cdot \frac{d}{dx}(3X)$$

$$P' = (Ln\,3)\,3^{x^2-3X} \cdot (2X-3) \qquad Q' = 3\,SEC^2(3X)$$

$$P'Q + PQ'$$

$$f'(X) = (Ln\,3)\,3^{x^2-3X}\,(2X-3)\,TAN(3X) + 3^{x^2-3X} \cdot 3\,SEC^2(3X)$$

$$= \boxed{3^{x^2-3X}\left[(Ln\,3)(2X-3)\,TAN(3X) + 3\,SEC^2(3X)\right]}$$